Patent Claims

1. A method for heat treating a cast, homogenized and subsequently cooled metallic extrusion billet or - when hot shears are used - rod portion, preferably made of a light metal alloy, immediately before it is fed into the extruder,

a) wherein the extrusion billet/rod portion (1) is reheated,

b) the reheated extrusion billet/rod portion (1) is subsequently cooled, and

c) is delivered to the extrusion device, characterized in that

d) the extrusion billet/rod portion (1), based on a diameter of 200mm, is reheated to the desired temperature in 20 minutes at most, and in that

e) the reheated extrusion billet/rod portion (1) is exposed to passive temperature equalization for 3 minutes at most,

f) said temperature equalization resulting in a temperature uniformity, based on a diameter of 200mm, of less than ±10K.

2. A method for heat treating a cast, homogenized and subsequently cooled metallic extrusion billet or - when hot shears are used - rod portion, preferably made of a light metal alloy, before it is fed into the extruder,

a) wherein the extrusion billet/rod portion (1) is reheated,

b) the reheated extrusion billet/rod portion (1) is subsequently cooled, and

c) is delivered to the extrusion device, in particular as set forth in claim 1, characterized in that

d) the reheated extrusion billet/rod portion (1) is exposed to rapid cooling using water spray nozzles (25), such that - based on a diameter of 200mm - a temperature at least 150K below the extrusion temperature is set on the surface of the extrusion billet/rod portion (1) within a nozzle spraying period of 30 seconds at most, and in that

e) the desired temperature distribution is set in the extrusion billet/rod portion (1), both over its cross-section and along its length, by the end of a temperature equalization period which is longer than the nozzle spraying period.

3. The method for heat treating an extrusion billet/rod portion (1) as set forth in any one of claims 1 or 2, characterized in that the extrusion billet/rod portion (1) is heated to the highest optimum temperature for the respective alloy, and, at an extrusion temperature which is lower than this temperature due to the requirements of the extrusion process, is rapidly cooled following said heating, wherein the extrusion billet/rod portion (1) is cooled such that after an active cooling period and a subsequent temperature equalization period it exhibits the desired, lower extrusion temperature, in particular when a so-called temperature taper is generated while cooling from the highest optimum temperature for the respective alloy to the lower extrusion temperature required for the extrusion process.

4. A method for heat treating an extrusion billet/rod portion, in particular as set forth in any one of claims 1 to 3, characterized in that the extrusion billet/rod portion is heated in a first part (7) by gas burner flames which contact the surface, and in a second part (8) by forced convection by means of hot gas nozzle jets blown onto the surface of the material, and in that the last sub-section (8b) of heating by forced convection substantially serves to equalize the temperature in the material and is operated with only a low excess temperature as compared to the end temperature.

5. A method for heat treating an extrusion billet/rod portion, in particular as set forth in any one of claims 1 to 4, characterized in that - directly following a preceding rapid heating - rapid cooling is anticipated using individual water spray nozzles (25) whose axes are radially directed towards the horizontal axis of the material and which may be operated, individually or in groups, at different pressures and/or with different activation times.

6. The method as set forth in any one of claims 1 to 5, characterized in that demineralized water is used as the cooling fluid.

7. A device for heat treating a cast, homogenized metallic extrusion billet or - when hot shears are used - rod portion, preferably made of a light metal alloy, immediately before it is fed into the extruder, comprising

a) a heating device (7, 8) and

b) a cooling device, characterized in that

c) the heating device comprises a first part (7) using heating by gas burner flames which contact the surface, and a second part (8) using heating by forced convection by means of hot gas nozzle jets blown onto the surface of the material,

d) wherein the last (in the direction of material transport) sub-section (8b) of heating by forced convection substantially serves to equalize the temperature in the material and is operated with only a low temperature above the end temperature.

8. A device for heat treating a cast, homogenized metallic extrusion billet or - when hot shears are used - rod portion, preferably made of a light metal alloy, immediately before it is fed into the extruder, in particular as set forth in claim 7, characterized in that

a) the cooling device serves to rapidly cool the reheated extrusion billet/rod portion (1) using individual water spray nozzles (25),

b) whose axes are radially directed towards the horizontal axis of the material, and

c) which may be operated, individually or in groups, at different pressures and/or with different activation times.

9. A device for heat treating a cast, homogenized metallic extrusion billet or - when hot shears are used - rod portion, preferably made of a light metal alloy, immediately before it is fed into the extruder, in particular as set forth in any one of claims 7 or 8, characterized in that

a) the burners used are recuperation burners, wherein the recuperator for preheating the combustion air is individually integrated into each burner respectively, and

b) the burner jets exit the burner nozzle at a high velocity, wherein in particular at least a few recuperation burners can be operated in flox mode.

10. The device as set forth in at least one of claims 7 to 9, characterized in that the nozzles of the recuperation burners (22) are fitted with orifices made of a material with high temperature stability, to alter the cross-section of the burner jets (24), wherein in particular the nozzles of the recuperation burners (22) change the direction of the burner jets (24) and/or the orifices divide the burner jets (24) up respectively into at least two individual jets.

11. The device as set forth in at least one of claims 7 to 10, characterized in that the extrusion billet or rod portion (1) is in a fixed position in the rapid cooling device during the cooling process, said rapid cooling device consisting of annular arrangements of individual nozzles (25), wherein in particular each group of nozzles is formed by the nozzles of an annular arrangement of nozzles and/or the nozzles exhibit different sizes according to their orientation with respect to the shell surface of the billet.

12. The device as set forth in at least one of claims 7 to 11, characterized in that during the cooling process, the billet is held by a clamp mounting (34) which grips the facing sides of the billet and may be set to various billet lengths, and which in particular comprises catches (34c) on the lower face of the billet, for additionally securing the billet through a positive lock.

13. The device as set forth in claim 12, characterized by a loading/unloading position for the clamp mounting (34), before the cooling means.

14. The device as set forth in any one of claims 7 to 13, characterized in that the cooling period is different for the individual groups of nozzles, wherein in particular a period of time for temperature equalization follows the cooling period.

15. The device as set forth in at least one of claims 7 to 14, characterized in that - for short times per billet - at least two cooling devices are operated in parallel.

16. The device as set forth in any one of claims 7 to 15, characterized in that the nozzles of the rapid cooling device are supplied with cooling fluid from a pressure accumulator.